bustion leaving the heating chamber, there is a temperature drop, or cooling of the gases in the heating chamber, of 9()()°7 that is to say, the gases remain in the* chamber only four or five seconds.

If these data are considered in connection with an ordinary type of continuous heating furnace for ingots, in which the lower free surface of the gases is in contact with the hearth of the furnace, and the height from the hearth to the* roof is 0 m 75, the velocity of the gases entering the heating chamber will be 5 m 41 per second and of those leaving the chamber 3 m 42 per second.

The average velocity will be

$$\frac{5.41+3.42}{2} = 4.41 \text{ meters per second;}$$

from this it may be determined that the length of such a furnace will be from 17 m 00 to 22 m 50.

Therefore, when the velocity of the current of hot gases must be limited to very small values the result will be a long heating chamber.

One of the many defects in the olden* types of roverboratory furnaces was the constriction of the opening over the bridge wall where the hot gases entered the furnace. This resulted in an impinging current of burning

gaseous way of the brickwork owing to the high velocity of the gases. This high velocity was considered necessary in order to effect an intimate mixture of the combustibles and the eornburent. This method of mixing is now considered undesirable[4] and ineffective. In the later types of reverberatory furnaces it has been completely abandoned. An intimate mixture of the* producer gas from the jfirebox and the secondary air is essential, but this mixture should not be made at the bridge wall.

The height of the opening over the bridge wall may be computed by Yesmann's formula

IX. REVERBERATORY FURNACES CONSIDERED AS INVERTED WEIRS WITH A CISTERN OR .RESERVOIR. DIMENSIONS UPON WHICH THEIR CORRECT OPERATION DEPENDS

As a general proposition, very long furnaces are not common and in many cases are undesirable. Nevertheless, it is sometimes necessary to retain the hot gases in the heating chamber as long